Notification No. 4

Amendments No. 1/IRC:24/November 2017

To

IRC:24-2010- "Standard Specifications and Code of Practice for Road Bridges, Section-V, Steel Road Bridges" (Limit State Method)
(*Third Revision*)

S. No.	Clause No. Page No.	For	Read
1.	ANNEXURE G, (Page 202)	WORKING STRESS DESIGN (based on IRC:24-2001)	ANNEXURE G referring to WORKING STRESS DESIGN Stands Withdrawn
2.	502.2.2.2 (Page 24)	The principal mechanical properties of the structural steel important in design are the yield stress, f_y, the tensile or ultimate stress, f_u, the maximum per cent elongation on standard gauge length and notch toughness. Except for notch toughness, other properties are determined by conducting tensile tests on samples cut from the plates, sections etc., according to IS 1608. For notch toughness test IS 1499 may be referred.	The principal mechanical properties of the structural steel important in design are the yield stress, f_y, the tensile or ultimate stress, f_u, the maximum per cent elongation on standard gauge length and notch toughness. Except for notch toughness, other properties are determined by conducting tensile tests on samples cut from the plates, sections etc., according to IS 1608. Refer to IS:2062-2011 for notch toughness of different grades of steel.The notch toughness requirement of steels to be used in bridges is presented in new Clause 502.2.2.3.
3	502.2.2.3 (Page 24)	–	New Clause 502.2.2.3 introduced after clause 502.2.2.2, as illustrated below

502.2.2.3 Fracture toughness requirement (Refer Sl. No. 3 above)

In order to avoid brittle fracture, the steel members and joining parts material should be selected to have adequate fracture toughness taking into account the following:

a) Design minimum service temperature of the part
b) Fracture criticality of the member/part
c) Type of the steel (Grade & quality) and construction detail used in the part
d) Thickness of the stress carrying part.

The provisions of this clause shall apply irrespective of fatigue assessment requirement for a part as per Clause 511 of IRC:24. The charpy V-notch toughness of different types of steel as per IS:2062:2011 are given in **Table (i)**. For other grades of steels, reference may be made to the relevant codes. It shall be established (either based on experimental evidence or specialist literature) that steel proposed to be used in a bridge/part will be able to sustain number of design cycles for design stress range at minimum service temperature of the part. Minimum service temperature shall be as specified in clause 215 of IRC:6, viz., (i) -35ºC for snow bound areas and (ii) minimum shed air temperature – 10ºC for other areas.

Steel selected as per the guidelines given in clause 502.2.3.1 shall be deemed to satisfy the requirement of this clause.

Unless indicated otherwise in the contract plans, Charpy V-notch toughness requirement are not mandatory for the following items.

- Intermediate transverse web stiffeners not serving as connecting plates
- Bearings, sole plates, masonry plates
- Expansion plates

- Drainage components
- Filler plates in bolted connection in double shear

Table (i) Charpey v-notch toughness Requirement of Different Steels as per IS:2062-2011

Grade	Quality	Max. Yield stress (MPa)	CVN at Test Temperature
E 250	A, BR, B0, C	250	27
E 275	A, BR, B0, C	275	27
E 300	A, BR, B0, C	300	27
E 350	A, BR, B0, C	350	27
E 410	A, BR, B0, C	410	25
E 450	A, BR	450	20

Note: Test temperature for CVN values are 25ºC for BR, 0ºC for B0 and -20ºC for C grade.

502.2.3.1 Selection of steel

For the purpose of toughness evaluation, minimum service temperature zones are classified as given in **Table (ii)**.

Table (ii). Temperature Zone Classification for Charpy V-Notch Requirement

Minimum Service Temperature (ºC)	Temperature Zone
Above 0ºC	1
0ºC to -17ºC	2
Below -18ºC	3

Based on notch toughness requirement, selection table for various types of steel confirming to IS:2062:2011 for different temperature zone, plate thickness and fracture critically of the components is given in **Table (iii)**.

Table (iii) Selection Table for Steel

GRADE	Thickness (mm)	FRACTURE CRITICAL			NON-FRACTURE CRITICAL		
		ZONE 1	ZONE 2	ZONE 3	ZONE 1	ZONE 2	ZONE 3
E-250, E-275 & E-300	$t \leq 100$	BR	B0	C	BR	BR	B0
E 350	$t \leq 50$	BR	B0	C	BR	BR	B0
	$50 \leq t \leq 100$	B0	C	C	BR	B0	B0
E-410	$t \leq 100$	C	NP	NP	B0	C	NP
E450	$t \leq 100$	C	NP	NP	B0	C	NP

Note: i) NP – Not Permitted
ii) Charpy impact test shall be mandatory for using Quality BR

S. No.	Clause No. Page No.	For	Read
4	503.2.2.2. (Page 29)	–	New Sub-clause to 503.2.2.2.1 to clause 503.2.2.2 added as follows. ***503.2.2.2.1 Limiting Stresses for Serviceability*** (a) The nominal Stress due to bending Moment $f_b \leq \frac{f_y}{\gamma_{m,ser}}$

			(b) The Nominal Stress due to Shear $\tau_b \le \frac{f_y}{\sqrt{3}\gamma_{m,ser}}$ (c) Combined Stress $\sqrt{f_b^2 + 3\tau_b^2} \le \frac{f_y}{\gamma_{m,ser}}$ (d) The Nominal Stress range due to frequent load combination should be limited to $1.5f_y / \gamma_{m,ser}$ **Note:** a) Where relevant the above checks should include additional stresses from transverse load. b) The value of γ_m shall be taken as 1.0. c) For global analysis the effect of plate buckling on the stiffness may be ignored when the effective cross-sectional area of an element in compression is larger than 50% of the gross cross-sectional area of the same element.
5	509.7.2.4, (Page 104)	t_w = minimum required web thickness for spacing using tension field action, as given in clause 509.4.2.1	t_w = minimum required web thickness

Notification No. 5

Errata No. 6/IRC:112/November 2017

To

IRC:112-2011 – "Code of Practice for Concrete Road Bridges"

S. No.	Clause No. Page No.	For	Read
1	10.3.3.4 (page 94)	Sections having both bonded and unbonded tendons shall be treated as in Clause 10.3.3.3 making use to only bonded tendons as reinforcement	Sections having both bonded and unbonded tendons shall be treated as in clause 10.3.3 making use of only bonded tendons as reinforcement.

Notification No. 6

Subject: Withdrawal of IRC Publications:IRC:SP:11-1984, IRC:SP:47-1998 & IRC:SP:57-2000

The Following publications of IRC have been amalgamated into IRC:SP:112-2017- "Manual for Quality Control in Road & Bridge Works" which has been released by IRC - November, 2017.

i) IRC:SP:11-1984 "Handbook for Quality Control for Construction of Roads and Runways"

ii) IRC:SP:47-1998-"Guidelines for Quality Systems for Road Bridges"

iii) IRC:SP:57-2000- "Guidelines for Quality Systems for Road Construction"

Aforesaid 3 publications stand withdrawn with immediate effect.

Notification No. 7

Subject: Withdrawal of IRC:SP:94-2011 "Material Testing Facilities for Highway Sector in NCR"

The IRC:SP:94-2011 "Material Testing Facilities for Highway Sector in NCR" published by Indian Roads Congress in 2011 stands withdrawn with immediate effect.